<u>REMARKS</u>

Background of the present Invention

The present invention relates generally to the processing of signals from an input sensor. In particular, the present invention relates to the processing of signals corresponding to positions of mechanical interactions with the input sensor.

From such signals, data corresponding to the position of a mechanical interaction with the input sensor may be derived. This data may then correspond to an entry in a look-up table of, for example, displayable characters. Thus, the present invention may be applied to a computer having a keyboard sensor input.

The problem addressed by the present invention is that known processing means for signals corresponding to positions of mechanical interactions with an input sensor are able to recognize individual mechanical interactions only. With such systems, in the event that a second mechanical interaction is made before the first mechanical interaction is released, the individual mechanical interactions are not recognized.

The present invention provides data processing means configured to recognize both individual mechanical interactions in the event that two overlapping mechanical interactions are made with the input sensor. A second different mechanical interaction is recognized before the first mechanical interaction is released, and this feature serves to increase the speed of data entry when more than one finger or stylus is used.

Summary of the first described embodiment of the present Invention

Reference is made to the first described embodiment of the present invention described in the present specification.

In this embodiment, a computer (101) is configured to receive signals from an *XY* position sensor (106) on which a QWERTY keyboard (102) is based. A programmable peripheral interface controller (PPIC) (501) is configured to supply and receive voltages to and from the keyboard (102), and to supply data to the computer (101). A program executed by the PPIC (501), to generate two types of data from keyboard signals, is outlined in Figure 7,

The two types of data take the same format; however, the first type of data corresponds to the position of a mechanical interaction with the keyboard (102), whereas the second type of data corresponds to the absence of a mechanical interaction with the keyboard (102). All data generated from keyboard signals satisfying the conditions of the program outlined in Figure 7 is sent from the PPIC (501) to the computer (101). .

A program executed by the computer (101), to generate characters from received data is outlined in Figure 13. Processing of data according to this program includes handling data received from overlapping key presses on the keyboard (102) to generate a first character corresponding to the position of a first key press and to generate a second character corresponding to the position of the second overlapping key press.

OBJECTIONS

Remarks regarding objection of terminology In claim

In Paragraph 5 of the Office Action, the Examiner states that "predetermined amount" is a relative term. Applicant respectfully submits that "predetermined amount" is not a relative term.

In pending claims 3 and 15, the term "predetermined amount" is used in relation to a process of determining whether received positional data is stable, as described in Page 19, Lines 1-8.

In pending claims 11 and 18, the term "predetermined amount" is used in relation to a process of determining whether received positional data relates to a different mechanical interaction, as described in Page 19, Line 9 to Page 20, Line 1.

In pending claims 6 and 17, the term "predetermined amount" is used in relation to a process of determining whether received positional data is to be treated as a valid mechanical interaction, as described in Page 17, Line 15 to Page 18, Line 22.

It is submitted that whilst a parameter may enable a process, its exact magnitude may vary between applications. The term "predetermined amount" thus indicates that the value of the parameter in issue is established prior to use of the process.

It is proposed to replace the term "predetermined amount" in pending claims 6 and 17 with the term "predetermined threshold value".

Remarks regarding drawings objection

In Paragraph 6 of the Office Action, the Examiner states that the feature of "a second data type corresponding to the absence of a mechanical interaction" and "an item of data of said second type" is not shown in the drawings.

Page 7, Lines 20-25 discloses:

"During operation of the keyboard, the interface circuit sends positional data to the computer 101 in the form of two eight bit binary numbers, i.e. two numbers of value between zero and 255 (decimal). However, there are no key positions corresponding to 0,0 and the use of these zero values is reserved to indicate to the computer 101 that the keyboard is not being pressed."

Page 21, Lines 15-17 discloses:

"In addition, in the event that the keyboard stops being pressed, a second data type, in this case the data 0,0, is sent to the computer 101 to indicate the absence of a key-press."

In the description of the first described embodiment, reference is made to a positional data type and a second data type. Both types of data take the format *#,#* where # is in the range 0-255; however, the first positional data type refers to all **non** 0,0 data and the second data type, indicating the absence of a valid mechanical interaction, is the data item 0,0.

This data item 0,0 is included in Figure 7 at steps 702 and 715, and Figure 13 at step 1304. Reference to this "null character" can also be found at steps 1309 and 1311 of Figure 13. Thus, it is submitted that the feature of the second data type is included in the drawings of the present application.

CLAIM REJECTIONS

Remarks regarding subject matter In claims objection-Paragraph 2

In Paragraph 2 of the Office Action, the Examiner raises an objection against pending claims 1 -20. The Examiner continues to state that the description is not enabling as to how the second data type is generated and used to generate data representing a first character and a character,

The Examiner is respectfully directed to the disclosure in Page 13, Line 8 to Page 28, Line 4 and Figures 5-13; in particular, Figures 7 and 13 and the accompanying description.

Remarks regarding subject matter in claims objection-Paragraph 3

In Paragraph 3 of the Office Action, the Examiner raises an objection against pending claims 1-10. The Examiner continues to state that the original disclosure when filed does not disclose "data corresponding to a central position of a mechanical interaction".

It is submitted that this objection relates to pending claims 19 and 20 only, since only these claims include this feature. It is further submitted that the following can be found in PCT patent application no. *PCT/GB01/01429,* filed 30 March 2001 on Page 17, Lines 8-11 (description accompanying Figures 6C and 6D at least):

> "Therefore, voltage V3 and V4 provide information as to the two dimensional position of the applied force on the sensor 106, i.e. voltages V3 and V4 represent X and Y values for the centre of the position of the applied force, representing a key-press".

Amendment to claim 19 to bring the related terminology into line with the above disclosure is proposed. Thus, it is submitted that proposed amended claim 19 and dependent claim 20 are supported by the disclosure in the originating PCT application.

Remarks regarding obviousness rejection in view of Nagao

In Paragraph 8 of the Office Action, the Examiner states that pending claims 1-6 and 13-19 are unpatentable over Nagao (US 6,532,003).

The data processing apparatus disclosed in Nagao comprises a device configured to receive data from a co-ordinate touch panel and data from a keyboard. The problem addressed by Nagao is that data received from the co-ordinate touch panel whilst a user is typing on the keyboard may trigger processes that are not intended. Nagao provides a device that is configured to deem data received from the co-ordinate touch panel whilst the keyboard is determined to be in use invalid (recognized as a "false touch"), and to ignore the invalid data. In achieving this aim, a program first determines which input device received data originates from.

This is in contrast to the present invention, which functions to generate characters from input data corresponding either to positions of mechanical interactions with an input sensor or the absence of a mechanical interaction with that sensor. When mechanical interactions at different positions overlap in time, the present invention is configured to generate a first character corresponding to the first mechanical interaction and to generate a second character corresponding to the second mechanical interaction. The present invention achieves this using the sequence in which items of data of either type are received. Through this process, input data from overlapping mechanical interactions is recognized as two individual mechanical interactions. A

second different mechanical interaction is recognized before the first mechanical interaction is released. This feature serves to increase the speed of input data entry.

As described in the present specification, when an individual mechanical interaction is made, an item of data of the second type, corresponding to the absence of a mechanical interaction, is followed by data of the first type, corresponding to the position of a mechanical interaction. In response, a first character is generated. During overlapping mechanical interactions, data of the first type corresponding to a second different mechanical interaction is followed by an item of data of the second type, corresponding to the absence of a mechanical interaction, and in response a second character is generated.

These features of the overlapping mechanical interaction handling operation of the present invention are included in each pending independent claim 1, 13,19.

This mode of operation is not disclosed in Nagao, which does not seek to provide such a function and provides no teaching how to achieve this function.

Although the Examiner refers to the Nagao device handling data from the co-ordinate touch panel and the keyboard in a "parallel manner", when both are operated at the same time, the Nagao device invalidates the co-ordinate touch panel data and does not process it to produce an output. In contrast, the present invention processes data corresponding to a second mechanical interaction that overlaps a first mechanical interaction to produce an output.

The present claims are considered to be novel and non-obvious over Nagao. However, clarifying amendments to the present set of claims are proposed.

Remarks regarding obviousness rejection in view of Nagao further in view of Fullerton

In Paragraph 9 of the Office Action, the Examiner states that pending claims 7-12 and 20 are unpatentable over Nagao (US 6,532,003) in view of Fullerton (US 6,426,868).

Fullerton discloses keyboard apparatus for connection to a portable processing device. The apparatus comprises a keyboard, a keyboard cover configured to also function as a support easel for the portable device, a stabilizing leg for the portable device and an I/O connector.

Fullerton, which is cited against dependent claims only, is not considered to add to the disclosure in Nagao. The Examiner is therefore directed to the remarks regarding Paragraph 8,

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt

and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: Mar 11, 2004

By: _Greg Stobbs_
Gregory A. Stobbs
Reg. No. 28,764

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

GAS/vlm